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PATENT
856550-45

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: FU, et al.

Art Unit: 1771

Serial No.: 10/028,499

Examiner: Ula Corinna Ruddock

Filed: December 19, 2001

Title: LIGHTWEIGHT BALLISTIC
RESISTANT RIGID STRUCTURAL PANEL

DECLARATION OF PRIOR INVENTION TO OVERCOME CITED PATENT
(37 C.F.R. § 1.131)

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

1. We, the undersigned, are the inventors of the invention disclosed in this application.
2. This declaration is to establish invention of the claimed subject matter of this application at a date prior to October 25, 2001, that is the effective date of U.S. Patent No. 6,568,310 (Morgan), newly cited by the Examiner in the last Office Action dated February 18, 2004.
3. This declaration is submitted with a first reply after final rejection, for the purpose of overcoming a new ground of rejection made in the final rejection.
4. The invention as defined by Claims 1-19 was conceived prior to October 25, 2001, and diligently reduced to practice from just prior to October 25, 2001 to a subsequent reduction to practice. To establish possession of subject matter according to the invention, and due diligence from just prior to the reference date to a subsequent reduction to practice, the enumerated exhibits described below are submitted as evidence.

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June 16, 2004

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5. Exhibit A attached hereto is a true and correct copy of two pages from a daily journal maintained by Robert Fu, dated just prior to October 25, 2001. These pages show a proposed construction for a rigid ballistic-resistant material according to the invention. Exhibit A demonstrates possession by us of subject matter falling within the claimed invention, on a date just prior to October 25, 2001.
6. Exhibit B attached hereto is a true and correct copy of a ballistics test report, prepared by John Fales and dated November 9, 2001. The report concerns a rigid, ballistics-resistant material constructed according to the invention, referred to in the report as a "hardened composite panel." This tested material had an area density of about 2 pounds per square foot, and as recorded in the report, was demonstrated to have a ballistic resistance not less than level IIIA of the National Institute of Justice Standard 0101.04, on a date prior to November 9, 2001. The tested material was a rigid material suitable for a structural application, such as an aircraft cockpit door.
7. Exhibits A and B demonstrate that a material according to the invention was reduced to practice not less than sixteen days after October 25, 2001. The present application was filed on December 19, 2001.

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8. We hereby declare that all statements made herein of our own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

SIGNATURE OF THE FIRST NAMED INVENTOR


Robert C. Fu

6-16-04
Date

SIGNATURE OF THE SECOND NAMED INVENTOR

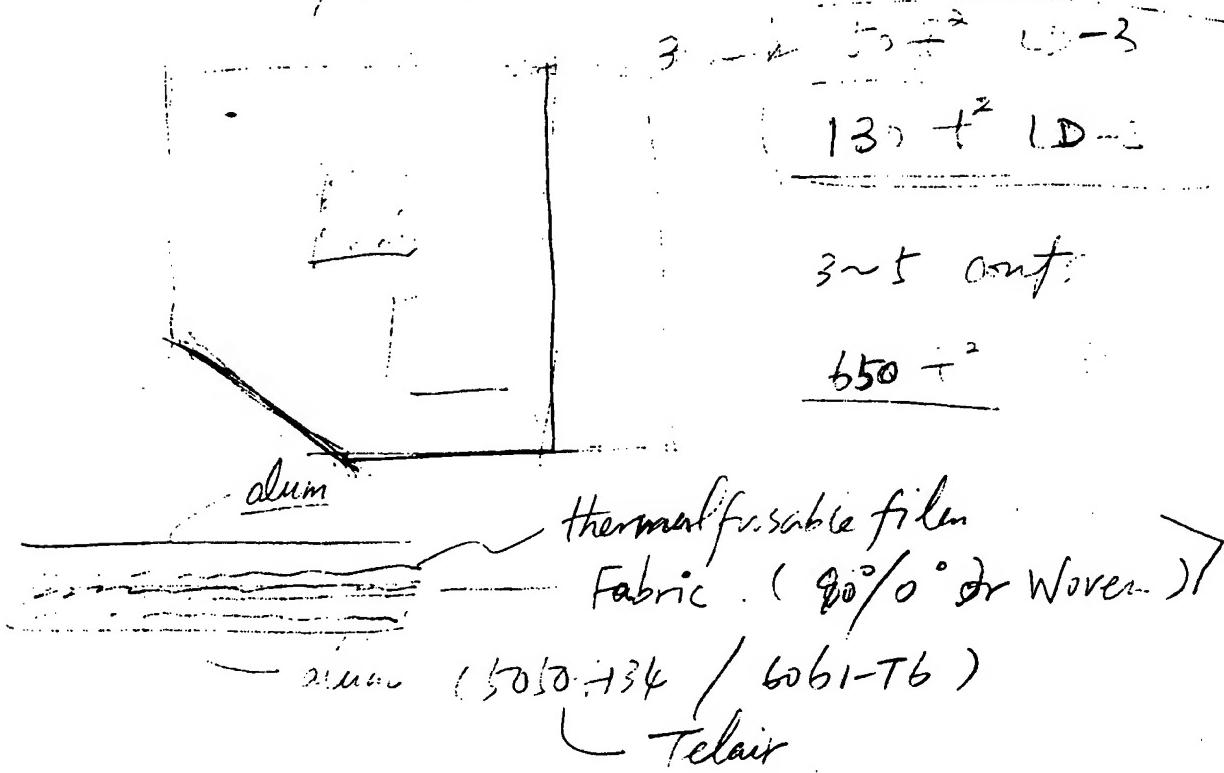

John Fales

6/16/04
Date

DAILY JOURNAL

10-22-01 CD Poltec , special material application
Jerry Lee .

possibility of making test sample
Fiber/fabric is avail.



phase I compn . 2~3 weeks

phase II actual panel 2-3 months

② Left Jon Mowery a message will hold the drawing until hearing from him.

Jon opening the mail package

Jon will make the cross when finished
15 min.

③

| | |
|----------------|--------------|
| Spaceloft | .015" |
| film - 310 | .005" |
| Phenolic/glass | .080" |
| L302 | .005" |
| Kevlar | .17" |
| Nomex | .338" → .70" |
| L302 | .005" |
| Phenolic/glass | .020" |
| | 0.639" |

try to bond Surlyn to Nomex!

0-23-01 ④ for #958465 Tom Logston, 3M tape
Primer 94.

② stat meeting

The L and tomorrow

+ 5, 8 sides

+ 10 minutes



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| Document No. | Title | Rev. | Date | Product P/N |
|--------------|--------------------------|------|---------|-------------|
| E1291.TR | Hardened Composite Panel | N/C | 11-9-01 | N/A |

HARDENED COMPOSITE PANEL BALLISTICS TEST

REPORT NO. E1291.TR

Prepared By: John Fales, Project Engineer

Approved By: Robert Fu, Director of Engineering

Date of Initial Release: 11-9-01



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Background

Telair International hardened composite panel was designed for aircraft cockpit door application. The panel utilizes the similar technology developed for Telair's hardened lower deck baggage container. The panel is capable to meet NIJ level IIIA threat and FAR 25.853 flammability requirements. It can be customized to have various thickness, certain load carrying capacity and flexure stiffness to suit different requirements of various aircraft.

Purpose

The purpose of this test is to verify the capability of the hardened panel to meet the ballistic resistance requirements of NIJ level IIIA threat.

Test Sample and Equipment

A 1" thick, 14" x 23" hardened composite panel was used. Four quadrants were marked on the panel for various tests.

.44 Mag. 240 Gr. LSWC cartridges, Approx. 1400 ft/sec.

.357 SIG 125 Gr. TMJ cartridges, Approx. 1400 ft/sec.

Since this test was conducted for R & D purpose, projectile speed is only an estimate based on type and amount of powder load.

Test Procedure

Placed and secured test panel on a wooden easel with a 4" thick balsa wood as a back support as shown in Fig. 1.

- Test No. 1: At a distance of 16 feet, one round of .357 Sig (9 mm caliber) was fired in the lower right quadrant.
- Test No. 2: A single round of .44 magnum in the lower left quadrant at a distance of 16 feet.
- Test No. 3: Next, the top right quadrant received fifteen tightly placed rounds of .357 Sig (9 mm caliber) fired in succession within a 3.5" circle.
- Test No. 4: Next the top left quadrant received six rounds of .44 magnum within 3.5" circle.
- Test No. 5: In addition, two rounds of 9mm (Hirten Berger full metal jacket, steel core, round nose) was fired in the lower right quadrant a few inches away from the single .357 Sig fired in Test No. 1.



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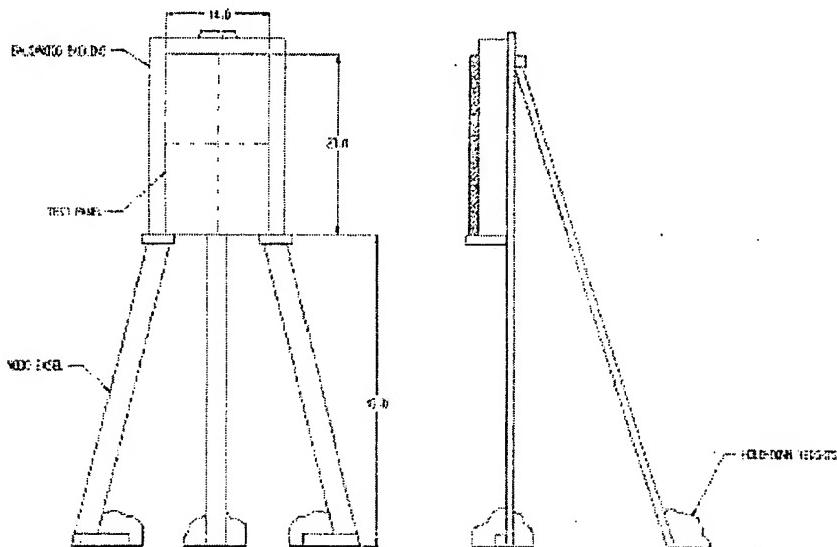


Fig. 1 Test Setup

Test results

Inspection revealed no penetration of the panel in all cases. Backside indicated only slight skin cracks and fiber tear in the area of 6 rounds .44 magnum shots. Front side skin, although punctured, retained all rounds within the panel. Evidence of skin delamination noted on the top left quadrant due to shots placed close to the open edge. Front and backside of the test coupon are shown in the Figure 2, 3, 4 and 5.



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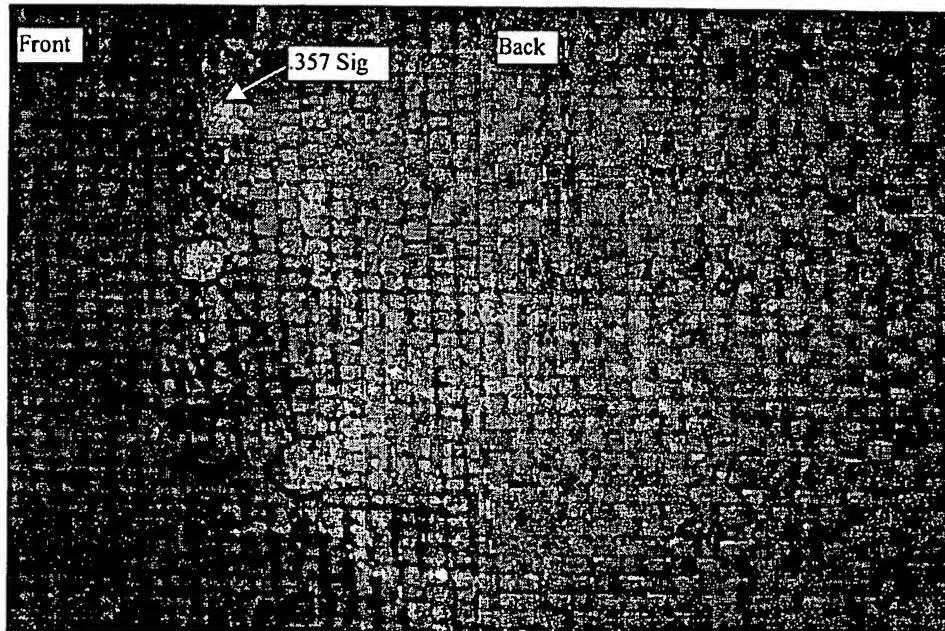


Figure 2 Single Round .357 Sig and 2 Rounds 9mm Hirten Berger FMJ Steel Core



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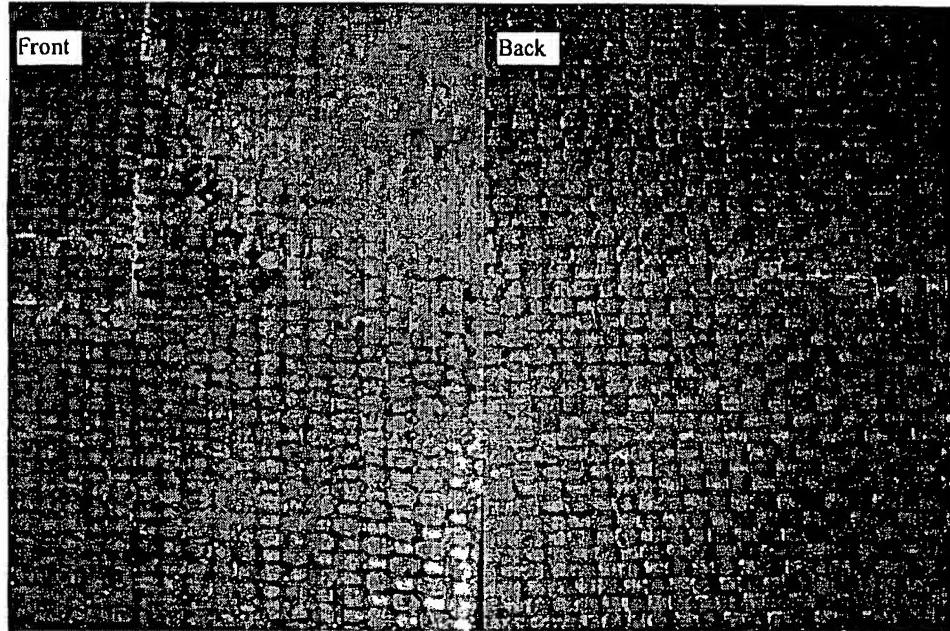


Figure 3 Single Round .44 Mag



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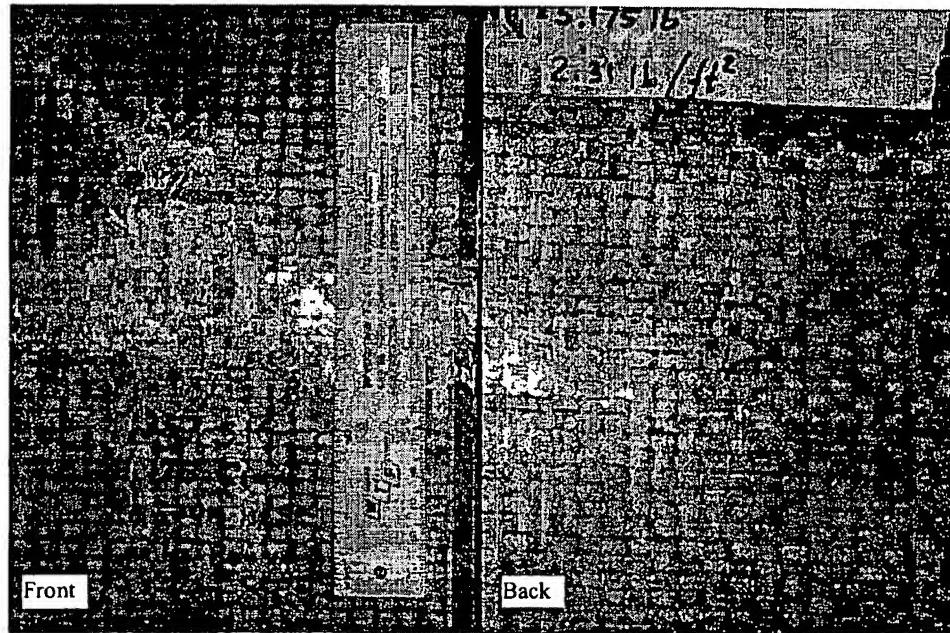


Figure 4 15 Rounds .357 Sig Within a 3.5" Circle



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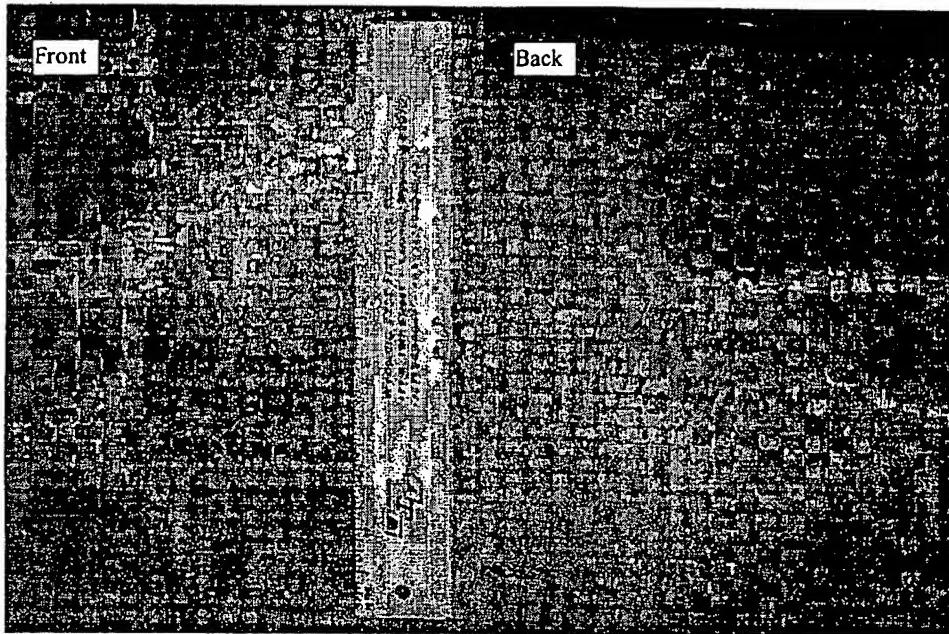


Figure 5 6 Rounds .44 Mag Within a 3.5" Circle

Conclusion

It is evident from this test that given panel construction satisfies NIJ level IIIA threat ballistic requirements.